



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/677,870	10/03/2000	Woo Hyuk Choi	2658-0240P	6124
2292	7590	01/30/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			RUDE, TIMOTHY L	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/677,870		CHOI ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Timothy L Rude		2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \*   c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claims***

1. Claims 1, 4, 7-10, 13, and 16-18 are amended. Claim 14 is canceled. Claims 19 and 20 are added.

### ***Claim Objections***

2. Objections to claims 1, 4, 7-10, 13, 14, and 16-18 are withdrawn.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5, 6, 8, 10-12, 14, 15, 17, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (Kim) USPAT 6,429,909 B1 in view of Song et al (Song) USPAT 6,313,889 B1.

As to claims 1, 2, and 19, Kim discloses in the third embodiment, Figures 6 and 7, (col. 6, line 35 through col. 7, line 5), a thin film transistor substrate in a liquid crystal

Art Unit: 2871

display provided with a data line, 400, for applying a data signal, a gate line, 100, for applying a gate signal, and a transparent pixel electrode, 600, for driving a liquid crystal cell, said substrate comprising: repair lines, 110 and 120, (Applicant's gate dummy pattern) formed of the same material layer as the gate line (col. 6, lines 38-42 and col. 2, lines 10-17) so as to extend vertically from the gate line, 100, and to overlap the pixel electrode, 600, and data line 400, to compensate for misalignment occurring along the data line.

FIG. 6

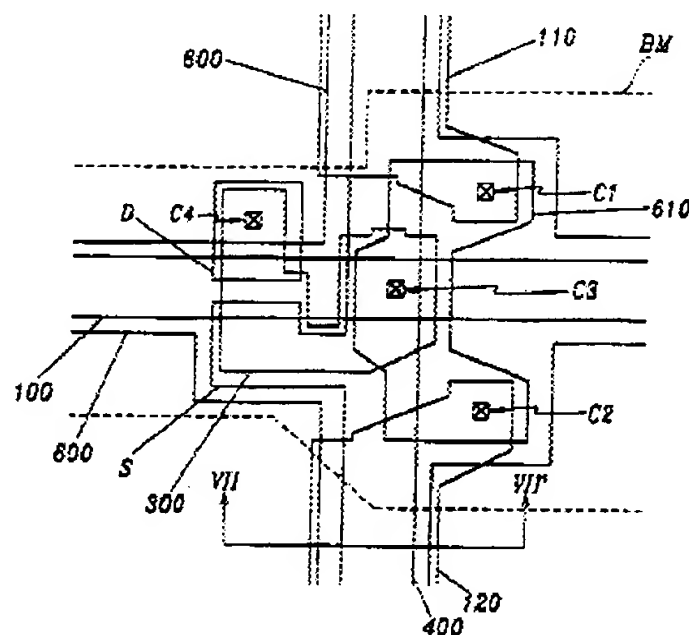
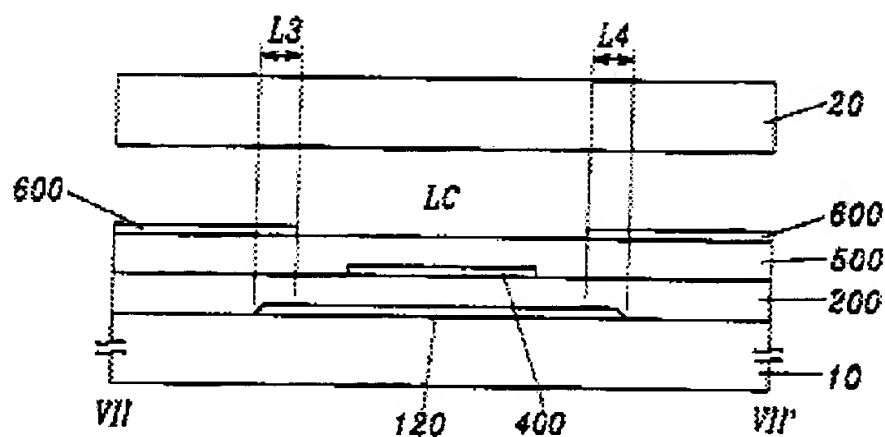


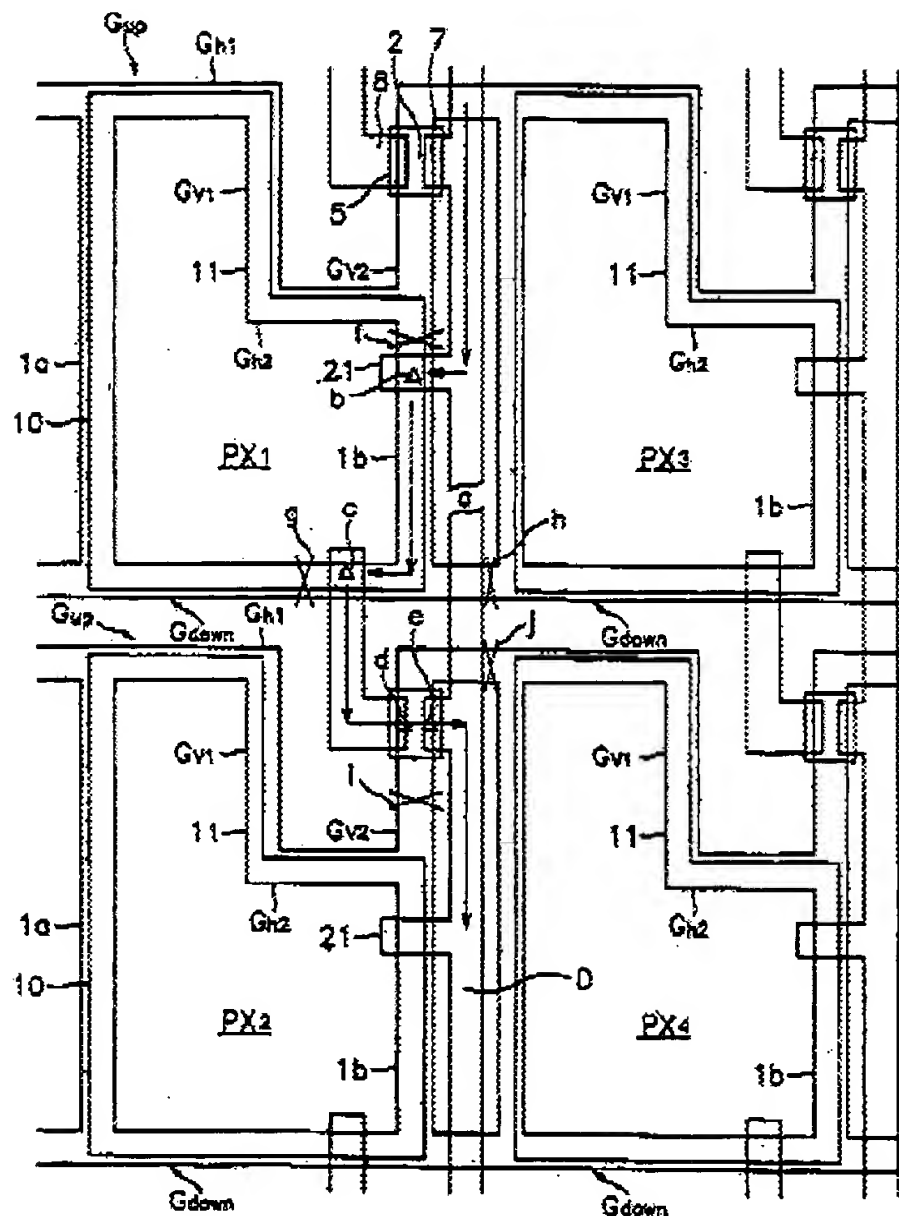
FIG. 7



Kim does not explicitly disclose a display wherein the gate dummy pattern is integrated with the data line.

Song teaches the use of a redundant pattern that is integrated with the gate line in Figure 19A ( $G_{up}$  and  $G_{down}$  or 1a and 1b) as a redundancy electrode for electrically connecting the gate line to the broken data line (col. 17, lines 4-67, especially col. 17, lines 47-54) to effect repairs.

FIG. 19A



Song is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to form the gate dummy pattern in such a manner as to serve as a redundancy electrode for electrically connecting the gate line to the broken data line to effect repairs.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim with the

Art Unit: 2871

redundancy electrodes for electrically connecting the gate line to the broken data line per Song.

As to claims 10, 11, 14, and 20, Kim in view of Song disclose the display above. Kim further discloses repair lines, 110 and 120, (Applicant's gate dummy pattern) formed of the same material layer as the gate line (col. 6, lines 38-42 and col. 2, lines 10-17) so as to extended vertically from the gate line, 100, and to overlap the pixel electrode, 600, and data line 400, to compensate for misalignment occurring along the data line. Therefore the amount of overlap is an art-recognized results effective variable to compensate for misalignment occurring along the data line.

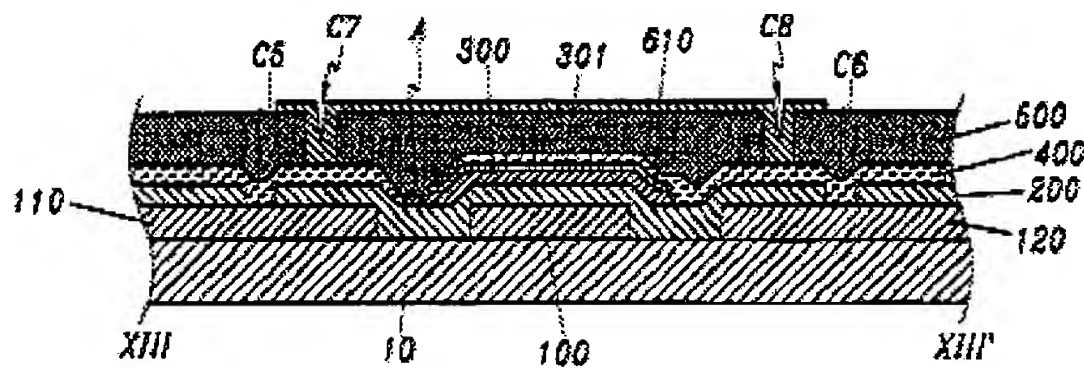
Therefore deriving the claimed range of 0.5-1  $\mu\text{m}$  would take only ordinary skill in the art of liquid crystals to compensate for misalignment occurring along the data line (MPEP 2144.05 II).

As to claim 5, Kim discloses the use of repair lines, 110 and 120, (Applicant's gate dummy pattern) as a black matrix (col. 6, lines 48-59 and col. 1, line 66 through col. 2, line 2).

As to claims 3 and 12, Kim discloses the thin film transistor substrate according to claims 1 and 2.

Kim teaches in Figure 13 the use of forming holes and connections to the repair lines, 110 and 120, (Applicant's gate dummy pattern) and to a connecting pattern, 610, to repair a broken data line, 400, (col. 8, lines 1-15).

**FIG. 13**



Kim teaches in Figure 26 the use of repair lines, 104, (Applicant's gate dummy pattern used as a redundancy electrode) to connect the gate line to the data line (col. 13, lines 4-17).

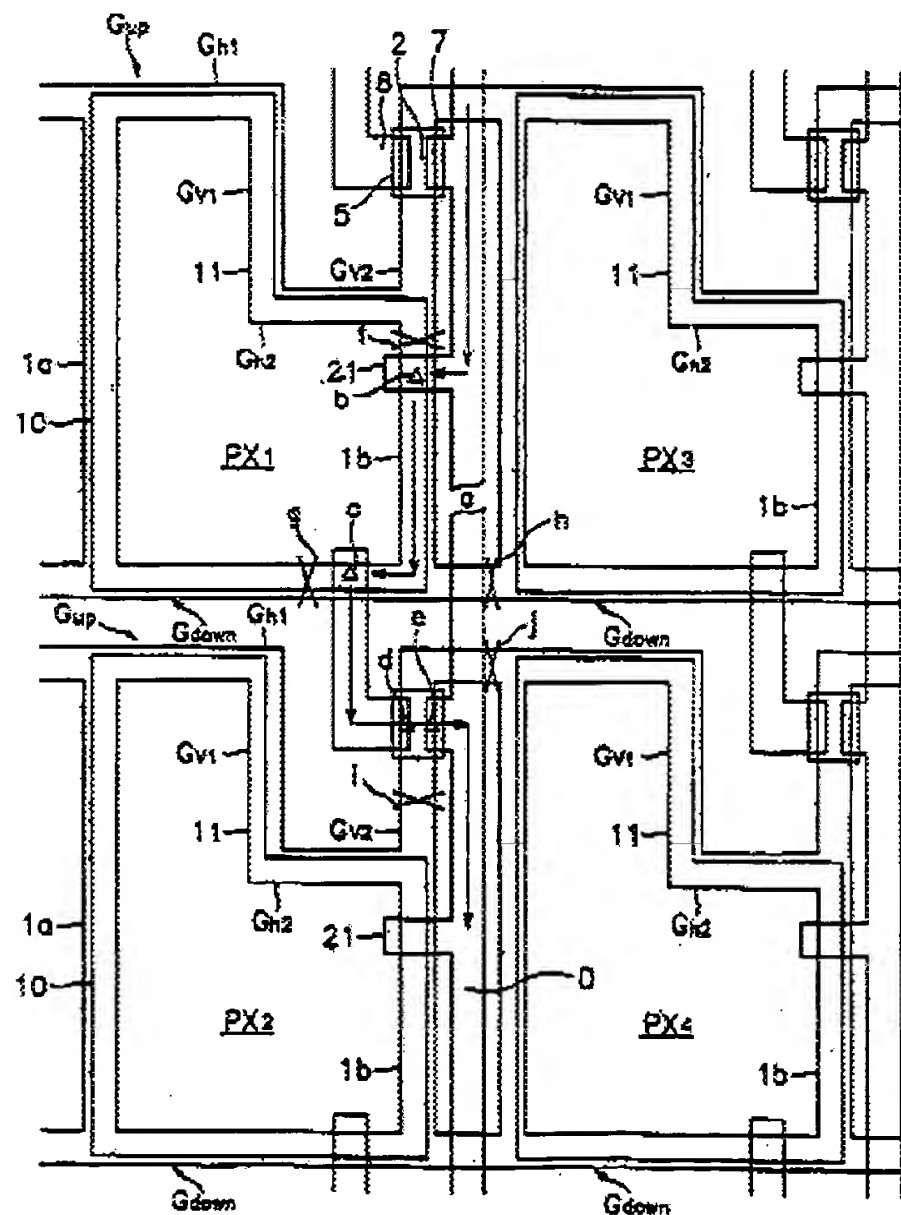


Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim by forming holes and connecting gate dummy patterns to gate lines to repair a broken data line.

As to claims 3 and 12, Kim discloses the thin film transistor substrate according to claims 1 and 2.

Song teaches the use of a redundant pattern in Figure 19A ( $G_{up}$  and  $G_{down}$  or 1a and 1b) as a redundancy electrode for electrically connecting the gate line to the broken data line (col. 17, lines 4-67, especially col. 17, lines 47-54) to effect repairs.

**FIG. 19A**



Song is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to form the gate dummy pattern in such a manner as to serve as a redundancy electrode for electrically connecting the gate line to the broken data line to effect repairs.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim with the redundancy electrodes for electrically connecting the gate line to the broken data line per Song.

As to claims 6 and 15, Song teaches in Figure 18 a thin film transistor substrate further comprising: a storage capacitor (col. 15, lines 56-64) defined by a horizontal overlapping part,  $G_{h2}$ , between the gate line and the pixel electrode, PX. Song also teaches in Figure 18 an analogous overlapping portion, 21, of the data line, D, to permit a repair.

Song is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to form the gate dummy pattern in such a manner as to form a capacitor and to include a hole connected to the gate line and formed to permit a repair.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim with the capacitor, dummy pattern, and hole per Song.

As to claims 8 and 17, mere duplication of parts is not patentably distinct unless unexpected results are obtained.

Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Song as applied to claims 1-7 and 10 above, and further in view of Cheng USPAT 5,657,101.

As to claims 8 and 17, Kim in view of Song discloses the display above.

Kim in view of Song does not explicitly disclose gate dummy patterns on both sides of the data line.

Cheng discloses patterns made from the gate metal layer (Applicant's gate dummy patterns) on both sides of the data line in Figure 5d (col. 4, lines 26-61) to improve the aperture ratio.

Cheng is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add gate dummy patterns on both sides of the data line to improve the aperture ratio.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim in view of Song with the gate dummy patterns on both sides of the data line of Cheng to improve the aperture ratio.

4. Claims 4, 7, 9, 13, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Song as applied to claims 1-7 and 10 above, and further in view of Irie et al (Irie) USPAT 5,734,450.

As to claims 4, 9, 13, and 18, Kim in view of Song discloses the display above.

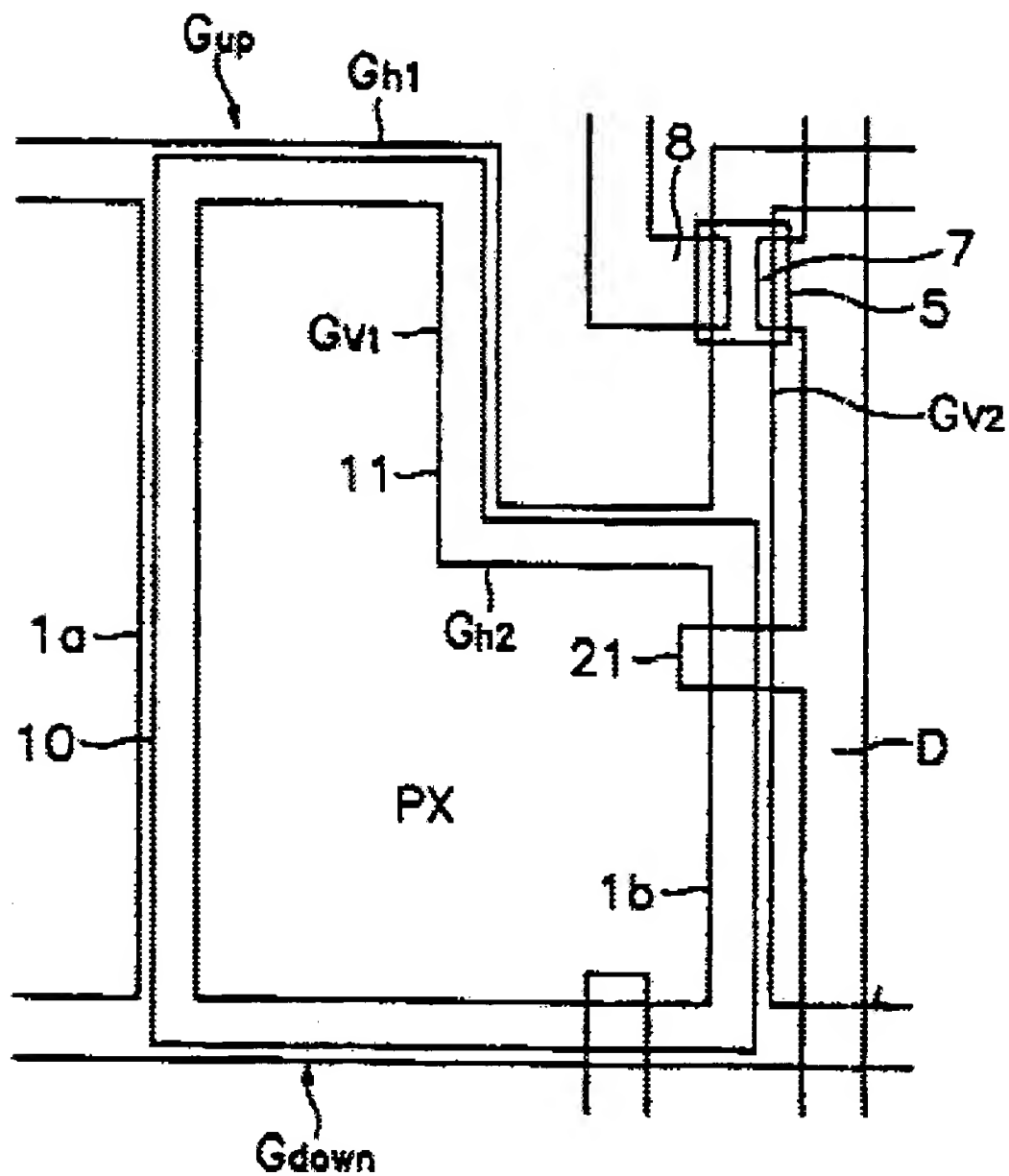
Kim in view of Song does not explicitly disclose a recess in the dummy pattern to make it easier to cut for purposes of repair, thereby disconnecting the gate dummy pattern from the gate line.

Irie teaches as prior art that a structure branching off the gate line may be made narrow (Applicant's recess), and not overlapping the data line, to facilitate laser cutting (col. 2, lines 7-20) for purposes of repair (col. 2, lines 61-67) which allows for easy correction of point defects.

Irie is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a non-overlapping recess in the gate dummy pattern to facilitate laser cutting for purposes of repair, which allows for easy correction of point defects.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim in view of Song with the non-overlapping recess in the gate dummy pattern to facilitate laser cutting for purposes of repair, which allows for easy correction of point defects.

FIG. 18



As to claims 7 and 16, Song teaches in Figures 18 and 19A a protrusion, 21, protruded from the data line in such a manner to overlap with the intended repair site (Applicant's recess and narrowed portion of the gate dummy patterns), the structure of which would thereby shut off a light leaked between the gate dummy pattern and the

Art Unit: 2871

gate line (col. 15, lines 42-63). Note that in considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

Song is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a protrusion in the data line, formed in such a manner to overlap with the area of the recess and narrowed portion of the gate dummy patterns, to permit a repair.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Kim with the protrusion of Song to permit a repair.

### ***Response to Arguments***

5. Applicant's arguments filed on 10 November 2003 have been fully considered but they are not persuasive.

#### **Applicant's ONLY arguments are as follows:**

(1) Kim does not disclose "a gate dummy pattern formed so as to extend vertically from the gate line ..., the gate dummy pattern being integrated with the gate line."

(2) Song does not teach integration of the gate pattern with the gate line due to certain connection details.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that Song was applied to teach the integration of the gate pattern with the gate line.

(2) It is respectfully pointed out that the connection details referred to by Applicant are those effecting a repair. The invention of Song entails gate dummy patterns integrated with the gate line to permit such repairs.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.




Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



Timothy L Rude  
Examiner  
Art Unit 2871

TLR  
January 26, 2004



ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800